



QUARTERBACK TOOLS

TM

*Maximizes the speed and reliability of
your Amiga hard disks and floppy disks!*



Central Coast Software

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QUARTERBACK TOOLS

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TECHNICAL ASSISTANCE

If you experience difficulty with Quarterback Tools, and have returned your postage-paid product registration card to Central Coast Software, you may call (303) 526-1030 for technical assistance between the hours of 8:30AM and 5:00PM, Mountain Time, Monday through Friday. Our FAX number is (303) 526-0520.

TRADEMARKS

Quarterback and Quarterback Tools: Central Coast Software. Amiga, Amiga Workbench, and AmigaDOS: Commodore-Amiga, Inc. WordPerfect: WordPerfect Corporation. Professional Page: Gold Disk, Inc. PostScript: Adobe Systems, Inc. LaserJet IIP: Hewlett Packard Corporation.

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WHAT IS QUARTERBACK TOOLS?

Quarterback Tools is a program for the Amiga personal computer which corrects all kinds of problems on Amiga hard and floppy disks. If you have ever seen this message (and who hasn't):

Error validating Disk - is Unreadable

or this message:

Volume Workbench has a read/write error

then you need Quarterback Tools!

If you have used your Amiga for any length of time, you have already faced the problems that frequently occur with the floppy disks and hard disk drives where we store our files. Quarterback Tools solves disk and file problems caused by unpleasant visits of the GURU, unexpected power failures, accidental file deletions, disk formatting mistakes, mechanical problems, aging, or physical damage to the disk storage medium.

Quarterback Tools makes unusable disks usable again and puts read/write errors in their place...out of the way, where they won't bother you. Quarterback Tools restores deleted files and formats disks in a way that preserves the old files, just in case you decide you want them back again. It can even *unformat* disks!

Use Quarterback Tools to check the integrity of your disks and detect and correct problems *before* they become serious.

Quarterback Tools also optimizes performance of both floppy and hard disks. Have you noticed lately that it seems to take a lot longer to load files from your hard disk drive than when the drive was new? Does your floppy disk drive sound like a washing machine gone berserk and the icons seem to take forever to appear on your screen when you open a new drawer? Quarterback Tools corrects these problems, too!

FEATURES

QUARTERBACK TOOLS FEATURES

- Optimizes hard disk and floppy disk performance
- Eliminates file and space fragmentation
- Restores lost or deleted files
- Finds bad blocks and marks them "out of service"
- Makes unusable disks usable again
- Recovers files from corrupted disks
- Formats disks in a way that preserves old files
- Unformats disks formatted by mistake

Quarterback Tools features fall into four catagories:

- Volume information (volume statistics, space fragmentation)
- Problem correction (restoring deleted files, finding and marking bad blocks, fixing corrupted disks)
- Performance optimization (defragmenting files, relocating files and drawers to optimum locations)
- Formatting/unformatting utilities.

We designed Quarterback Tools to do its job with little or no help from you. You don't need to know how a file is stored on a disk in order to use Tools. We have made a serious attempt to avoid using "filing system" jargon in this manual to describe what Quarterback Tools does and in the messages displayed on the screen.

HARDWARE AND SOFTWARE REQUIREMENTS

Quarterback Tools runs on all models of the Amiga, including the Amiga 3000. It works with all known accelerator cards.

It works with all AmigaDOS-compatible hard disk and floppy disk drives, including high-density floppy drives, and removable cartridge drives. It supports partition sizes up to 1 GB (1000 megabytes).

It requires a minimum of 512KB of RAM, but it can utilize as much memory as is available for improved speed, under user control. Note that for large hard disk partitions (in excess of 100MB) it may require 1MB of RAM on the Amiga.

Although it was designed with hard disks in mind, the program does not require a hard disk drive, and performs its functions on floppy disks with excellent results.

Quarterback Tools requires Workbench V1.2 or later, and was developed on and works very well with an Amiga 3000 under Workbench V2.0.

Quarterback Tools works with both the old (original) and new (Fast File System) AmigaDOS filing systems. It also supports disk drives formatted to block sizes other than the standard 512 bytes.

INSTALLATION

INSTALLATION

Quarterback Tools is not copy protected in any way. We encourage you to make one or more backup copies of the Quarterback Tools master disk for your own protection. But please do not give or sell copies of Quarterback Tools to other people!

Before you install or use Quarterback Tools, please read the Release-Notes file on the Quarterback Tools master disk. Just click on the Release-Notes icon. There you will find the latest changes to the program, if any, and any corrections to this manual.

You can run Quarterback tools from a floppy disk or install it on your hard disk. All you need to do is copy Quarterback Tools from its master disk to your hard disk or to your working Workbench floppy disk.

From Workbench:

- Load the Quarterback Tools master disk into a floppy disk drive.
- Double-click on the QBT disk icon.
- Double-click on the Workbench System drawer.
- Drag the Quarterback Tools program icon to the SYSTEM drawer.

or, from CLI:

- Load the Quarterback Tools master disk into a floppy disk drive.
- Use the CLI COPY command to copy Tools and Tools.icon to the drawer of your choice, such as SYSTEM.

INSTALLATION

Remember, keep a copy of Quarterback Tools on floppy disk in case your hard disk fails! You may need Quarterback Tools to get your hard drive going again, but if your only copy of Quarterback Tools is on the hard disk...well, you get the picture!

As the last step of installation, please send us your postage-paid product registration card. If we find any serious problems with your version of Quarterback Tools, we will probably contact you with an offer of a **FREE** upgrade to correct the problem. And if we decide to add new features, you may be offered an upgrade for a very low price (normally \$10-\$15). As a matter of company policy, we will not give out your name and address to any other company. But if we don't hear from you, we have no way to contact you, so you may miss out on a free upgrade or other special opportunities. The card is really for YOUR benefit, not ours. Fill it out and drop it in the mail today!

GETTING STARTED

GETTING STARTED

There are really only three steps to running Quarterback Tools: (1) start the program, (2) select a disk drive (volume) to process, and (3) select the function you want performed on the selected drive.

STEP 1. START THE QUARTERBACK TOOLS PROGRAM

If you have already installed Quarterback Tools on your Workbench floppy disk or hard disk, do this:

From Workbench, open the System drawer (or other drawer where you stored Quarterback Tools) and double-click on the Quarterback Tools icon.

or, From CLI, type TOOLS.

If you have not installed Quarterback Tools on your Workbench floppy disk or hard disk, or if your hard disk is "sick" and cannot be used, load the Quarterback Tools master disk (or preferably a copy) into a floppy disk drive, and:

From Workbench, double-click on the QBT disk icon and then double-click on the Quarterback Tools icon.

or, From CLI, type QBT:TOOLS.

STEP 2. SELECT THE VOLUME TO PROCESS

After displaying its initial greeting requester, Quarterback Tools lists on the screen the names of the disks (properly called volumes) currently available on your Amiga. Simply click on the name of the volume you wish to process. These volume names correspond to the disk names you see on the Workbench screen.

If you wish to process a floppy disk, the disk must actually be loaded in a floppy disk drive for the name

GETTING STARTED

of the disk to appear in the volume list. If you change floppy disks, the list of available volumes changes to reflect the actual names of the disks loaded and available at that moment.

This list of volumes includes only *validated* volumes. A validated volume is one which has passed minimal integrity tests applied by AmigaDOS when the volume is first made available to the system (when a floppy disk is first loaded or at startup for hard disks). If the volume you want to process is corrupted, the volume name may *not* appear in this list. When a volume becomes corrupted, AmigaDOS sometimes refuses to recognize the volume, making the files on the volume inaccessible to all normal Amiga programs. This, of course, is one of the reasons you may be using Quarterback Tools: to fix the validation problem of the corrupted volume so that you can regain access to the files stored there.

If the name of the volume you wish to process does *not* appear in the list of available volumes (because the volume has not passed AmigaDOS validation checks), you can select the volume indirectly by selecting the name of the disk drive on which the volume resides.

To view the list of disk drives available on your Amiga, select **DISPLAY DRIVES** from the menu bar. Quarterback Tools lists all mounted disk drives. Note that *all* drives are listed, including those with no disk loaded and those associated with an invalid volume. Simply click on the name of the disk drive holding the volume you wish to process. You can select a floppy disk drive even if there is no floppy disk loaded at the moment.

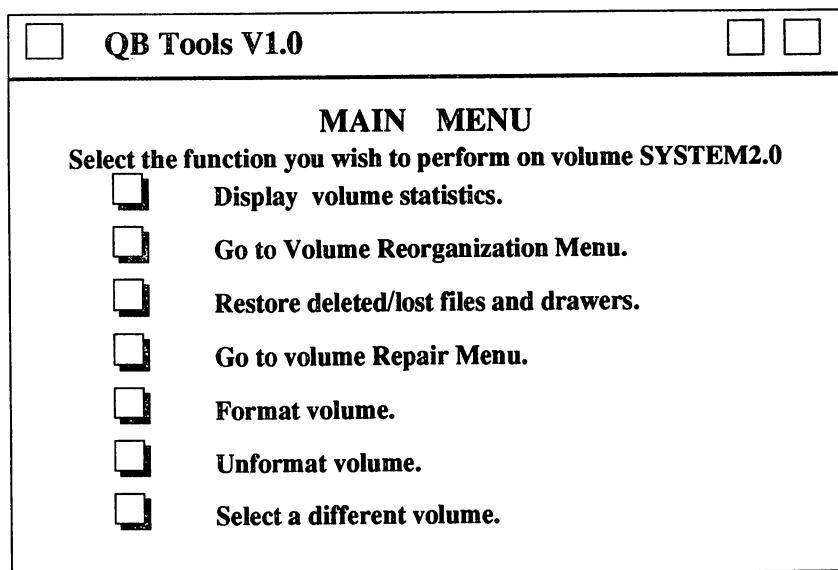
If you don't know which disk drive holds what volume, there are several ways to find out. One way is to use the CLI **INFO** command to display the disk drives and associated volumes. An invalid volume will show up here as "NOT A DOS DISK". Another way is to let Quarterback Tools tell you which volume, if any, is

GETTING STARTED

associated with a given disk drive, by selecting Display Volume Statistics from the Main Menu or Bad Volume Menu.

STEP 3. SELECT THE FUNCTION YOU WANT QUARTERBACK TOOLS TO PERFORM ON THE VOLUME YOU HAVE SELECTED.

After you have selected the volume or disk drive you want Quarterback Tools to work on, it displays a menu of functions it can perform on the selected volume or disk drive.



The menu above appears if you select a validated volume or if you select a disk drive containing a validated volume. This menu lists functions which can be performed on a valid volume only. Click on the gadget next to the function you wish to perform on the selected volume, or click on Select A Different Volume to return to the list of available volumes or disk drives.

GETTING STARTED

If you select a floppy disk drive which has no disk loaded or if you select a disk drive containing an invalid (corrupted) volume, Quarterback Tools displays a different menu of functions it can perform on the invalid volume.

☐ QB Tools V1.0☐☐

BAD VOLUME MENU

Select the function you wish to perform on drive DF2

- ☐ Display volume statistics.
- ☐ Attempt to repair bad volume.
- ☐ Restore files to a different volume.
- ☐ Format bad volume.
- ☐ Select a different drive.

These functions are designed to correct the problems of an invalid volume, or at least let you recover your files from the volume, if possible. If all else fails, you can also format the volume, restoring it to normal use, but effectively erasing all existing contents.

If you select a floppy drive containing no disk, Quarterback Tools displays this menu until a valid disk is loaded into the drive.

If your disk is so corrupted that the Amiga crashes every time you insert the disk into a floppy drive, you can direct Quarterback Tools to lock out AmigaDOS so that you can load the disk and process it with Quarterback Tools to correct the problem or recover your files. Select **AmigaDOS Disabled** from the menu bar.

REORGANIZING YOUR DISK DRIVES

REORGANIZING YOUR DISK DRIVES FOR OPTIMUM *SPEED*

Quarterback Tools can maximize the performance of any disk, whether floppy or hard disk, by rearranging the files on the disk to minimize the time required to find and read or write the files and their icons. If the performance of your disk drives seems to be slower than it used to be--it is! Quarterback Tools can solve this problem.

WHY DOES MY DISK DRIVE SEEM SO SLOW? - A TUTORIAL

As time goes by, you probably have noticed that it takes longer and longer for files to be loaded from or stored to your disk drives. This is true whether you use floppy disks or a hard drive. The problem gets worse as the drive (or diskette) gets full.

FILE AND SPACE FRAGMENTATION

This problem of decreased performance is caused by "file fragmentation". Your files are broken up into many pieces, stored in different places on the disk. You can't see this, because AmigaDOS keeps track of the pieces and puts them all back together when you access the file via a program. This fragmentation can happen to programs as well as data files. In fact it can happen when any file is written to a disk.

File fragmentation is both good and bad. It is *good*, because it allows the computer to use every bit of space available on a disk. It is *bad*, because to store or load a fragmented file, the computer must move the disk read/write heads to different places on the disk. Moving the read/write heads takes a lot of time. Loading or storing a file is much faster if the entire file is stored in one place on the disk. As a file becomes more fragmented and as these fragments become more scattered on the disk, the time required to load or save the file increases enormously.

REORGANIZING YOUR DISK DRIVES

File fragmentation is caused by "space fragmentation" on the disk. When a disk is freshly formatted (in other words, empty) there is plenty of empty space to hold files. When a file is written to the disk, the entire file can all be stored in one place. As new files are written to the disk, the earlier files are "surrounded" by the new data. If an older file is then deleted from the disk, it leaves a free space or "hole" into which another file can be stored. But what if this new file is larger than the "hole"? In that case, the computer breaks the new file into pieces, or fragments, storing part of the file in the existing hole and scattering the remainder of the file into one or more other holes, wherever it can find room. If you add more data to an existing file, the resulting larger file will not all fit into the original space, resulting in a fragmented file. When you delete a fragmented file, each fragment leaves a hole in the disk space into which parts of a different file will eventually be stored. You can see that after a while, the space of a disk becomes highly fragmented.

The first files added to an empty disk, if they are never deleted or changed, will remain unfragmented. But files which are frequently added, rewritten, or deleted (the files you use the most) are the files most likely to become highly fragmented. The result is slow disk performance on the very files you care about the most! Fragmentation is more severe, and the results more serious, for larger files and when the disk is close to full.

You might wonder why the computer is not smart enough to prevent file fragmentation. Why doesn't it just find an empty space of the right size to hold the entire file? And if a space of the right size cannot be found, why not rearrange the other files to make room for the new file? Such features could have been designed into the "system software" of AmigaDOS, but would have made AmigaDOS itself take up much more computer memory. But worse than that, the time required to move the existing files around on the disk

REORGANIZING YOUR DISK DRIVES

to make room for a new file would be much greater than the time to save or load the new file even if it is fragmented. So the designers of AmigaDOS chose a compromise approach used by virtually all personal computers: break up files to fit whatever free space exists on the disk.

Quarterback Tools solves fragmentation problems in two ways. First, it collects all the fragments of each file together into a single, "contiguous" area of the disk. Next, it rearranges the files on the disk so that there are no "holes" in the disk space. One way of thinking of this step is that the files are all pushed to one end of the disk, leaving all the empty space at the other end. That way, when new files are added to the disk they are less likely to be fragmented, and if they must be fragmented, the fragments of each file will be close to each other.

FILES AND ICONS

You probably have noticed that sometimes it takes forever for the icons to appear on the screen when you open a drawer. If you use the LIST command from CLI or a directory program such as DiskMaster you may have noticed that it seems to take too long for the file names to be displayed. The problem is that when you add new files (and the icons that go with them) to the disk, AmigaDOS stores the new files and icons wherever there is room for them on the disk. This scattering of related files and icons around the disk means that the disk heads must be moved all over the disk to read the file names and/or icons. The result is slow loading of icons or file names.

Quarterback Tools solves this problem by rearranging files and icons so that they reside on the disk as close as possible to the drawer to which they belong. That way the disk heads don't have far to move to load the icons of the drawer or to list the files belonging to the drawer. The result is much faster performance when you open a drawer or LIST the files of a drawer.

REORGANIZING YOUR DISK DRIVES

HOW TO REORGANIZE YOUR DISK

To reorganize a disk, select the volume by name, and select Go To Volume Reorganization Menu from the Main Menu. You will see the following menu.

☐ QB Tools V1.0☐☐

VOLUME REORGANIZATION MENU
Select the function you wish to perform on volume SYSTEM2.0

- ☐ Display volume space fragmentation.
- ☐ Examine and report file and space fragmentation.
- ☐ Reorganize volume and defragment files.
- ☐ Return to Main Menu.

Display volume space fragmentation

Select **Display volume space fragmentation** to see a graphic map of the space fragmentation of the volume, which shows you at a glance just how badly fragmented the free space on the volume really is. However, this display *does not* show how badly fragmented the files are.

Examine and report file and space fragmentation

Select **Examine and report file and space fragmentation** to find out how many of the files on the volume are fragmented. Quarterback Tools scans the entire volume, checking each file on the volume for fragmentation and performing an integrity test on each block of the

REORGANIZING YOUR DISK DRIVES

volume. The results of this test tell you how many fragmented files were found on the volume. But this is a "read only" test. If you really want to reorganize the volume, you must select the third item from the menu.

Reorganize volume and defragment files

Before you reorganize your volume you should select the reorganization mode you prefer and the amount of memory you want to allow Quarterback Tools to use.

The REORG MODE menu item offers two reorganization choices: **Workbench** or **CLI**. Workbench organization places the icons as close as possible to the drawer to which they belong, providing faster icon access when you open a drawer. CLI organization places the icons with the other files belonging to the drawer, providing equal access to all files of a drawer. You must make this choice *before* you start the reorganization.

Volume reorganization can take a very long time (measured in hours, in some cases). The speed of the reorganization is affected by the number of active files on the volume, how full the volume is, and how much memory is available to Quarterback Tools. You can control the memory usage by selecting Memory Usage from the menu bar. If you select **LOW**, Quarterback Tools uses as little memory as possible. If you select **MEDIUM**, Quarterback Tools uses about half of available memory. If you select **HIGH**, Quarterback Tools uses as much memory as it can find. Note: this latter choice means that you probably cannot start other programs during the reorganization, but the reorganization should take considerably less time to run. You must make this choice *before* you start the reorganization.

Reorganizing a volume *prevents* unformatting the volume or recovering deleted files afterwards, and should *never* be performed on a volume known to have problems.

REORGANIZING YOUR DISK DRIVES

Select **Reorganize volume** and **defragment files** to perform the actual optimization on the volume. When you start reorganization, Quarterback Tools first warns you to backup all critical files.

WARNING - DO NOT ATTEMPT TO REORGANIZE A VOLUME UNTIL AFTER YOU HAVE BACKED UP ALL IMPORTANT FILES TO FLOPPY DISKS OR OTHER BACKUP MEDIA. If reorganization fails, for any reason, **ALL** of the files on the volume may be lost or totally scrambled.

Central Coast Software **CANNOT** be held **responsible** for any loss of files which may occur during reorganization of a volume. It is **YOUR** responsibility to ensure that all critical files are backed up before reorganizing a volume.

You should never attempt to reorganize a corrupted volume. If you know that the volume has read/write errors or is known to be corrupted (even though it passes the AmigaDOS validation checks) you **SHOULD NOT** attempt to reorganize the volume. Use Quarterback Tools to repair the problems, and **THEN** reorganize the volume.

First, Quarterback Tools scans each block of the volume, performing a thorough integrity check and building a list of files to be defragmented and repositioned. If the integrity check detects unreadable blocks or corruption of any kind, the reorganization cannot proceed, but no files have been moved and the volume is unchanged.

Assuming no problems are found during the scan, Quarterback Tools proceeds with the reorganization. After the reorganization starts, it is **VERY** important not to turn off the power or do anything which could cause the Amiga to crash.

REORGANIZING YOUR DISK DRIVES

No matter what other disk reorganization programs (for the Amiga or any other PC) claim, it is impossible to guarantee that NO data will be lost during a volume reorganization if the power fails or the computer crashes. Even if a full copy is made of each file before deleting it from its old location, there still exists a window of vulnerability during the time that system tables are being updated. But worse, such a scheme assumes that sufficient free space exists on the disk at least equal to the size of the largest file. This is obviously impossible if any one file exceeds one-half the size of the volume (which is becoming increasingly common on the Amiga, with its large animation and sound files) or if the volume is very full. Accordingly, we designed Quarterback Tools to reposition files incrementally, permitting efficient reorganization of all volumes, even those **totally full**.

WHAT RESULTS TO EXPECT

Reorganization can produce dramatic improvements in disk performance, sometimes as much as a 400 percent. The amount of improvement depends entirely on how badly fragmented and disorganized the volume was before reorganization. The first time you reorganize a highly fragmented volume the results should be dramatic (and the time to reorganize long). Subsequent reorganizations will produce less spectacular improvements, but will take much less time to run.

WHAT TO DO IF REORGANIZATION FAILS

If the reorganization process fails to finish, for any reason, you should NOT depend on the contents of the volume. While you may be able to salvage some or all of your files using the **Restore files to a different volume** function of the Bad Volume menu, you may find those files to be corrupted. The safest recovery process is to format the volume and then restore the files from backup. If you failed to backup your files before the reorganization, then your files may be lost and unrecoverable.

RESTORING DELETED FILES

RESTORING LOST OR DELETED FILES AND DRAWERS

Quarterback Tools can, in most cases, find and restore files which you have deleted by mistake and can find and copy active and deleted files from a bad volume to another AmigaDOS volume. With Quarterback Tools, you no longer need to fear the GURU or the slip of a finger!

HOW CAN A DELETED FILE BE RESTORED? - A TUTORIAL

When the Amiga deletes a file, it really doesn't erase the contents of the file, it just "forgets" where the file is stored on the disk and removes the file name from the list of files belonging to that drawer. The actual file data is usually still intact, available to be "restored" to its original state or copied to another volume, if only there were some way to find it.

Quarterback Tools finds the pieces of a deleted file by scanning the entire volume, and, if it finds all the pieces, can restore deleted files to their original active status.

One major limitation is that restoration of newly deleted files *must* take place *before* any new files are written to the disk. The reason is this: any new file is likely to be written over the old deleted file, making restoration of the old file impossible. When a file is deleted by AmigaDOS, the blocks containing the "deleted" file data are marked as "free" - available to be used in a different file, if necessary. And if you write a new file to the disk before you restore the deleted file, there is a good chance that AmigaDOS will reuse the newly freed blocks of the deleted file to hold the new file data. If that happens, Quarterback Tools will be unable to recover the original file because its contents have been replaced with new data. Therefore, if you delete a file by accident (or even on purpose) and decide you want to restore it, your chances for success go way down if you write any other files to the volume first.

RESTORING DELETED FILES

If you are still using the Old File System (Workbench V1.2 or V1.3) you may be unable to restore all of a deleted file even if you DON'T write any new files to the volume because of a quirk of the file system in which it rewrites the volume bitmap into a free block of the volume even on a file deletion. If the free block it uses just happens to be a newly freed block of the deleted file, you will be unable to restore that file, even though you really have not written a new file to the disk. While this usually affects only a single deleted file, Murphy's Law says that this is the one file you want to restore. (This by itself is a good reason to switch to the new Fast File System, which DOES NOT walk all over the deleted data this way).

HOW TO RESTORE A DELETED FILE

To restore one or more lost or deleted files, select the volume from which the file(s) were deleted, and then select **Restore deleted/lost files and drawers** from the Main Menu.

Quarterback Tools first asks for the name of the file you want to restore. If you wish to restore only a single file and you know the name of that file, you can enter that name to limit the search. Otherwise, Quarterback Tools marks for restoration all deleted files it can find on the volume.

THE CATALOG OF ACTIVE AND DELETED FILES

To find deleted files and drawers, Quarterback Tools scans the entire volume, building a catalog of all active and deleted files and drawers on the volume. After completing the scan, Quarterback Tools displays the catalog of files it found on the volume. Deleted files are highlighted in a different color to distinguish them from active files.

RESTORING DELETED FILES

The catalog shows all active and deleted files so that you can decide which to restore or copy to a different volume. You can include a file for restoration by clicking once on its name. Note that the background color of the file changes. Click again on its name to exclude it from the restoration. Click on a drawer name to examine the contents of the drawer. Use the parent or root gadgets to move back to the parent or root drawers.

When the catalog is first displayed, all deleted files are "included" for restoration, unless you specified the name of a single file to restore. You can use the Include and Exclude menu bar items to select groups of files you wish to restore or copy. Watch the "selected to restore" file counts on the left of the catalog to ensure that your selection steps are correct.

Active files (files not deleted) cannot be restored to the current volume, since, by definition, they already exist on that volume. But you can copy active files to a different volume, which is very important if the current volume is corrupted. That is why Quarterback Tools allows you to include both deleted files and active files for restoration.

RESTORING DELETED FILES TO THE SAME VOLUME

When you have selected the files you wish to restore, click on the gadget **Restore files to current volume**. Quarterback Tools then scans the catalog for deleted files to be restored, and, if possible, restores them to their original drawers. Note that if a needed drawer has been deleted, Quarterback Tools will restore it also. However, if the necessary drawer cannot be found, Quarterback Tools gives you the option of restoring the "lost" files to the root drawer.

If, during the restoration process, Quarterback Tools finds that a file you selected already exists in the drawer (a newer version of the same file, perhaps), it

RESTORING DELETED FILES

asks you to provide a different name for the restored file.

Note that Quarterback Tools ignores any active files you may have selected, since they are already active and can't be restored.

COPYING ACTIVE AND DELETED FILES TO A DIFFERENT VOLUME

When you have selected the files (both active and deleted) you wish to copy to a different volume, click on the gadget **Copy files to a different volume**. Quarterback Tools first asks for the name of the volume and optional path where you want the selected files to be copied. You must enter the name of a valid, loaded AmigaDOS volume or disk drive. If you want the files copied to a particular drawer on that volume, the path to that drawer and the drawer itself must already exist on the target volume.

Unlike the restoration of files to the current volume, during the copy process Quarterback Tools *replaces* duplicate files on the target volume with files copied from the current volume. For this reason, you may wish to copy files to an empty target volume, such as a freshly formatted floppy disk.

If, during the copy process, the target volume becomes full, the copy process stops, and Quarterback Tools displays the file catalog again. Files which have been successfully copied are "deselected", but files remaining to be copied remain selected, so that you can continue the copy process to a different target volume, if you wish.

If you need to format a fresh floppy disk to hold the copied files, select **Init Floppy Disk** from the menu bar.

REPAIRING VOLUME PROBLEMS

REPAIRING VOLUME PROBLEMS

Volume problems can be severe and obvious (such as an invalid volume) or mild and hidden (such as undetected garbage in a seldom-used file). Half of the problem is knowing that there *is* a problem, so that you can do something about it. Quarterback Tools provides diagnostic and repair tools to detect and correct most types of volume problems, especially those which prevent AmigaDOS from functioning properly. The goal is to preserve your valuable files.

DISK ERRORS - A TUTORIAL

In a perfect world, we would always be able to read back from a disk every bit of data we sent there, with no errors. But in our less than perfect world, we find that disk drives do not always give us back what we give them. Being electromechanical devices, disk drives are subject to a variety of problems which can prevent successful reading of data. Writing data to any disk is a bit like throwing it into a black hole...you may never see it again!!!

In fact, we really can't be sure that our data will be readable after it is written, unless we immediately read it back from the disk and compare what we get back with what we wrote out. This "read after write" verification could be done automatically by the computer (and is, in some cases), but the extra time required to do so would double the time required to write a file to the disk. So in practice, this verification of the written data is seldom performed. And of course "read after write" verification does not absolutely guarantee that the data will always be readable hours or days later.

Of course, most of the time our disk drives work properly and our data comes back when we want it. But when the disk drive refuses to give back all or part of our valuable data, representing days or even months of

REPAIRING VOLUME PROBLEMS

our own creative effort, the level of our frustration can be great, indeed!

When an error occurs in reading data from a disk, the error normally affects a full block of 512 bytes, since they are treated as an entity. If a block cannot be successfully read from the disk, all 512 bytes of that block are effectively lost. Of course, other blocks of this file or some other file may also be unreadable. But the point here is that errors are detected when reading or writing the individual blocks that make up a file, no matter how large the file may be.

Disk errors fall into two general classes: physical and logical. In one sense it really doesn't matter whether the error is physical or logical. The result is the same: you may be unable to recover valuable data from the disk. However, the causes of these errors are quite different, and the solutions also differ.

PHYSICAL DISK ERRORS

A disk error is said to be physical if the disk drive cannot successfully read a block of data which had been previously written to the disk. Physical errors (sometimes called "hard" errors) are frequently caused by imperfections in the recording medium or mechanical problems with the head positioning mechanism. These problems often arise with age but can also be caused by physical damage or contamination.

When you see this message on the screen of your Amiga:

Volume (name) has a read/write error

it means that one block of data (512 bytes) on the disk cannot be successfully read from the disk to the computer. This is a physical error.

Physical errors usually cannot be corrected, although sometimes it is possible to continue to use the disk by simply avoiding the bad block. Quarterback Tools

REPAIRING VOLUME PROBLEMS

provides a feature to find such "bad blocks" and mark them "out of service". That prevents AmigaDOS from writing good data into the bad blocks, so that you can continue to use the disk. This doesn't matter much if the disk is a floppy disk, costing a few dollars or less. But if the disk is a large, expensive hard drive, you may not wish to toss it into the trash! See page 31.

A good example of a physical error is a floppy disk surface which has been scratched. The damage is permanent, data stored on the damaged blocks is unreadable, and the diskette will never be fully useful again.

LOGICAL DISK ERRORS

A disk error is said to be logical if the disk drive successfully reads a block of data from the disk, but the data is later found to have incorrect content. Logical errors (sometimes called "soft" errors) are usually caused by software problems (bugs) which cause valid data to be written to the wrong area of the disk or invalid data to be written where critical data was supposed to be stored.

When you see this message:

Key (number) has a checksum error

it means that one block of data (512 bytes) has been successfully read from the disk but a data validity check performed on the block of data by software reveals that the data cannot be trusted. This is a logical disk error. (The word key used in this message refers to an identification number for the data block in error. This has nothing to do with locks...)

Logical errors can cause visits by the GURU. This happens if the invalid data on the disk happens to be in a critical area of the disk directory structure. For example, if your Amiga crashes every time you open a particular drawer or try to access a particular file,

REPAIRING VOLUME PROBLEMS

your disk is probably suffering from a logical error. Quarterback Tools can often correct such problems. See page 32.

Logical errors are not permanent in the sense that you can restore the disk to full functionality by replacing the invalid data with correct data -- if you know what to put there. However, the most common method of recovering from logical errors is to format the disk, thereby erasing all data, including both valid and invalid data. This has a big disadvantage, however, in that all important data on the disk is lost.

However, Quarterback Tools provides features to find and correct logical errors without formatting the disk, thereby salvaging valuable data which might otherwise be lost. And Quarterback Tools has been written to anticipate logical errors so that it can find and correct them without crashing, thereby restoring full functionality to a disk which otherwise might have to be completely erased.

In summary, physical errors are hardware oriented, and are usually permanent. Logical errors are software oriented, and can be corrected. Quarterback Tools deals with both.

DISK ERROR CONSEQUENCES

When a disk error occurs, whether it is logical or physical, the error can be merely annoying or it can be devastating, depending entirely on how that lost block is used on the disk. If the lost data is part of a data file, the result may be loss of a portion of a file. While that may be annoying, it is not nearly so serious as an error involving a drawer or even worse, the root block (drawer) of the disk.

If the lost data is part of the logical structure of the disk, the error can cause some or all of the files on the disk to become inaccessible. The worst possible case is an error reading the root block, since it

REPAIRING VOLUME PROBLEMS

controls access to all files on the disk. If AmigaDOS cannot successfully read the root block of a disk, it cannot access any files on that disk. Period.

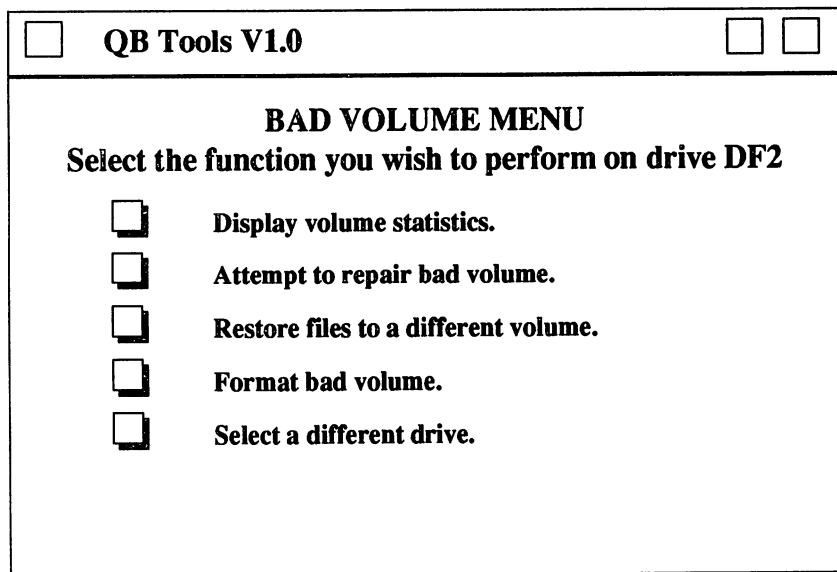
Note, however, that loss of some portion of the logical structure of the disk makes files inaccessible, but does not mean that the files are lost forever. Actually, the file data may be perfectly intact and readable, if only you knew which data blocks on the disk contain the data you want and in which order.

Quarterback Tools provides several solutions to this dilemma. It can usually find and repair errors in the logical structure of a disk, thereby restoring AmigaDOS access to the files. If repair turns out to be impossible, Quarterback Tools can locate files and copy them from the faulty disk to a different disk. See page 20.

REPAIRING VOLUME PROBLEMS

REPAIRING A BAD VOLUME

If the volume you select is so corrupted that AmigaDOS cannot validate it, Quarterback Tools displays the **Bad Volume Menu**:



☐ QB Tools V1.0

BAD VOLUME MENU

Select the function you wish to perform on drive DF2

- ☐ Display volume statistics.
- ☐ Attempt to repair bad volume.
- ☐ Restore files to a different volume.
- ☐ Format bad volume.
- ☐ Select a different drive.

Display volume statistics won't tell you much about an invalid volume except the volume status, the size of the partition in cylinders, and the name of the device driver. But sometimes that information can be useful.

If your disk is so corrupted that the Amiga crashes every time you insert the disk into a floppy drive, you can direct Quarterback Tools to lock out AmigaDOS so that you can load the disk and process it with Quarterback Tools to correct the problem or recover your files. Select **AmigaDOS Disabled** from the menu bar before you load the disk into the drive.

Before you attempt to repair an invalid volume, we highly recommend that you **Restore files to a different volume**. This gives you an opportunity to find and save

REPAIRING VOLUME PROBLEMS

critical files from the invalid volume while there is still a chance to salvage them. The repair effort may not be successful, and may actually make things even worse. Quarterback Tools will not let you **RESTORE** files onto an invalid volume...that would be very foolish. But you can **COPY** both active and deleted files to a different volume. See page 20.

If the repair attempt fails, your last resort is to **Format bad volume**. This effectively prevents any files on the volume from being recovered, so use this option only as a last resort.

ATTEMPT TO REPAIR BAD VOLUME

After you have recovered critical files from the invalid volume, select **Attempt to repair bad volume**. Quarterback Tools scans the active files of volume, starting with the root block (the drawer which opens when you click on a disk icon), looking for corrupted drawers, corrupted file headers, read/write errors in active blocks, and bitmap errors.

Problems detected by this check fall into two categories: major problems and minor problems. A major problem is defined as an error which results in a definite loss of data from one or more files. An example is an unreadable drawer (all files in the drawer are lost) or an unreadable file header (that one file is lost).

A minor problem is defined as invalid data in some non-critical part of the logical file structure which does not result in loss of data from a file. Examples: bad characters in a file name, an illegal date/time stamp, a ridiculous file size or bitmap errors.

The results of this test can be written to a report, and the report can be directed to a printer or to a disk file. To control the report, select **ERROR REPORT** from the menu bar and choose **No Report**, **Save to disk**, or **Send to printer**. If you specify **Save to disk**,

REPAIRING VOLUME PROBLEMS

Quarterback Tools asks for the device and path where you want the report to be written.

You can also control the way errors are displayed on the screen. Select SCREEN MODE from the menu bar and choose **Interactive** to display error requesters which wait for your action, **Informative** to see progress on the screen but no error requesters, or **Quiet** to avoid all screen activity.

ERROR READING ROOT BLOCK

The worst possible problem is that the root block cannot be read because of a physical error. In this case further repair efforts are useless, because all files and drawers on the volume are effectively lost. You may be able to copy your files from the bad volume to a different volume. See page 20. After copying your files from the bad volume, try to format the bad volume to restore it to active use. Then reload your files from the other volume.

If the root block is readable, repair of the volume is quite feasible.

REPAIRING VOLUME PROBLEMS

ERRORS REPORTED DURING VOLUME REPAIR

During the repair process, Quarterback Tools may find a great many different errors, depending upon the condition of the bad volume. These errors are displayed in a requester in the center of the screen. A typical error requester looks like this:

A Minor Problem has been found

Drawer: Workbench:C

Entry: DiskCopy

Error: File extension header checksum error

Action: Checksum recalculated

Proceed

Skip

Cancel

The top line of this requester indicates whether the *problem is major (resulting in loss of data) or minor (correctable with no loss of data). The next line indicates the drawer being processed when the error was detected. The third line indicates the file, if any, being processed when the problem was discovered. If there is no name displayed here, it means that the problem is within the drawer itself, not with a file belonging to the drawer.

The Error line of the requester displays one of more than thirty different error messages that describe the problem found by Quarterback Tools. Of necessity, some error messages include specific file system terminology

REPAIRING VOLUME PROBLEMS

which may be meaningless to you. Don't be concerned. What is much more important is the Action taken to correct the problem.

The Action line of the requester reports what action has (or will) be taken by Quarterback Tools to deal with the problem. These range from simply correcting the problem (such as replacing a bad date with the current date) to deleting a corrupted or unreadable drawer block.

The last line of the requester lists three choices of action: Proceed, Next File, or Cancel. If you select Proceed, Quarterback Tools continues testing the volume. If you select Next File, Quarterback Tools ceases testing the current file, if any, and proceeds to the next file. This can be very handy if you find a severely corrupted file which produces a seemingly endless series of error messages. Select Cancel if the volume appears to be so severely corrupted that repair is unlikely to be successful.

At the end of the repair process, Quarterback Tools displays a summary showing the types of errors found, if any, and a final statement regarding the condition of the volume.

FORMATTING A BAD VOLUME

If the repair attempt cannot succeed because of severe corruption and the files have been copied to a different volume, your last resort is to format the volume in hopes that at least you can return it to normal service (although empty). Select **Format bad volume** from the Bad Volume Menu. See page 38.

REPAIRING VOLUME PROBLEMS

REPAIRING A GOOD VOLUME

Quarterback Tools provides extensive error detection and correction features for valid volumes, which are found on the **Volume Repair Menu**:

☐ QB Tools V1.0☐☐

VOLUME REPAIR MENU

Select the function you wish to perform on volume SYSTEM2.0

- ☐ Find unreadable blocks; mark them "out of service".
- ☐ Find (but don't repair) bad files and drawers.
- ☐ Find and Repair bad files and drawers.
- ☐ Return to Main Menu.

These tests are intended primarily to be diagnostic in nature, since the volume must have passed AmigaDOS validation checks for this menu to be displayed. Nevertheless, it can be reassuring to know that your valuable files are intact and that there should be no problems with the volume.

FINDING UNREADABLE BLOCKS

Select **Find unreadable blocks; mark them "out of service"** to find any bad blocks on the selected volume. Quarterback Tools reads every block of the disk, looking for unreadable blocks.

Unreadable blocks are normally caused by physical errors on the disk drive. The danger is that data

REPAIRING VOLUME PROBLEMS

written to an unreadable block will most likely not be readable when you try to retrieve it later. AmigaDOS usually does not detect bad blocks during writes to the disk. To prevent this potential loss of data, Quarterback Tools marks unreadable blocks as "busy" so that AmigaDOS will not allocate those blocks to a file.

Of course, if the unreadable blocks are already part of an active file, you may discover that a file you thought was good is actually bad. This can happen more often than you might think! In our own testing of Quarterback Tools we were surprised to find corrupted files where we least expected them. See page 21 for more information on how these problems arise.

If Quarterback Tools finds unreadable blocks on the volume, it will notify you in a requester at the end of the test, and ask your permission to mark the blocks "bad". This involves creating a dummy file called BAD.BLOCKS in the root drawer of the volume to keep track of the blocks that have been marked bad. The other functions of Quarterback Tools have been designed to look for this file and to avoid the bad blocks. The count of bad blocks known to Quarterback Tools is listed in the Volume Statistics display.

If any bad block is contained in an active file, Quarterback Tools warns you of that fact. But it does not identify the file by name, because it really doesn't know the "ownership" of a bad block. To identify the file(s) affected by bad blocks, you must select **Find and Repair bad files and drawers** on the Volume Repair Menu.

We recommend that you run this test on all your volumes on a regular basis to detect problems before they become serious. When bad blocks occur, they can sometimes be corrected by "low-level" formatting of the volume, but this can take hours and totally erases all data on the volume. Most hard disk users prefer simply to avoid using the bad blocks until they get really bad or until there is time to perform low-level formatting.

REPAIRING VOLUME PROBLEMS

FIND (but don't repair) bad files and drawers

Use this menu selection to perform a thorough test of all files and drawers on a volume. This function warns you if it finds any problems, but makes no changes to the volume. You can run this test with write protection enabled, just to be safe.

We recommend that you run this test on all your volumes on a regular basis to detect problems before they become serious. If you find problems on the volume, you can determine how serious they are before you decide how to deal with them. However, if you want Quarterback Tools to correct the problems it finds, you must select **Find and Repair bad files and drawers**.

The results of this test can be written to a report, and the report can be directed to a printer or to a disk file. To control the report, select **ERROR REPORT** from the menu bar and choose **No Report**, **Save to disk**, or **Send to printer**. If you specify **Save to disk**, Quarterback Tools asks for the device and path where you want the report to be written.

You can also control the way errors are displayed on the screen. Select **SCREEN MODE** from the menu bar and choose **Interactive** to display error requesters which wait for your action, **Informative** to see progress on the screen but no error requesters, or **Quiet** to avoid all screen activity.

See **Errors Reported during Volume Repair** on page 21 for a discussion of the errors detected and reported by Quarterback Tools.

Find and Repair bad files and drawers

Use this menu selection to find **AND REPAIR** problems with files and drawers. You should use this selection only if you believe that the volume has problems, such as when unreadable blocks have been found on the volume which are part of active files.

REPAIRING VOLUME PROBLEMS

We cannot guarantee that Quarterback Tools will be able to correct every problem that can exist on a volume, but we have tested it extensively with a variety of problems which commonly arise on Amiga disks.

If Quarterback Tools finds unreadable blocks in a data file or finds an unreadable file header or drawer, it has no choice but to delete the faulty data. In the case of a file, this means deleting *the entire file*. The reason is that if it deletes a portion of a file, the resulting file is certainly corrupted. If this file is really a program, then the program will almost certainly crash when you attempt to run it (if not instantly, then surely very soon).

If the file is a text file, you could argue that most of the file could be saved, and that is true. For that reason, we highly recommend using the **Restore files to a different volume** option to salvage as much as possible of a corrupted file.

The results of this repair attempt can be written to a report, and the report can be directed to a printer or to a disk file. To control the report, select **ERROR REPORT** from the menu bar and choose **No Report**, **Save to disk**, or **Send to printer**. If you specify **Save to disk**, Quarterback Tools asks for the device and path where you want the report to be written. The written report can be a valuable aid in understanding what exactly has happened to your volume.

You can also control the way errors are displayed on the screen. Select **SCREEN MODE** from the menu bar and choose **Interactive** to display error requesters which wait for your action, **Informative** to see progress on the screen but no error requesters, or **Quiet** to avoid all screen activity.

See **Errors Reported during Volume Repair** on page 21 for a discussion of the errors detected and reported by Quarterback Tools.

FORMATTING AND UNFORMATTING DISKS

DISK FORMATTING - A TUTORIAL

As you probably already know, any floppy diskette or hard disk drive must be "formatted" (sometimes called "initialized") before you can use it to store files. But what exactly happens during formatting? First, you should know that there are two forms of formatting: high level and low level. Sometimes both are combined into a single operation so that you may not realize that two different steps are being performed by the formatting program. Such is the case if you Initialize (format) a diskette from the Workbench menu.

LOW-LEVEL FORMATTING

Low-level formatting is the first step in preparing a new disk (floppy or hard) to accept data. Before useful data can be written to or read from a disk, an underlying control structure of numbered tracks and sectors must be written to the disk. The writing of this structure to the disk is called "low-level" formatting.

Low-level formatting completely erases the prior contents, if any, of a disk. Because low-level formatting involves writing something to every block of the disk, this process may take a considerable amount of time, even an hour or more, in the case of a large hard disk. Fortunately, low-level formatting normally must be performed only once. With luck, low-level formatting may never need to be performed after the first time, unless physical problems arise with the magnetic medium. These may show up as sudden and unexplainable physical read/write errors on a disk which has been performing flawlessly.

Low level formatting is usually performed on a hard disk before delivery and installation. Floppy disks, on the other hand, usually arrive "unformatted". Hard disks usually require a specialized low-level format-

FORMATTING/UNFORMATTING

ting routine, normally provided by the hard disk vendor. Floppy disks, on the other hand, can be low-level (and high-level) formatted by the **FORMAT** program which comes with Workbench.

HIGH-LEVEL FORMATTING

High-level formatting is the second step in preparing a new disk to accept data. An empty drawer structure is written to the root block of the disk. One or more blocks called the *bitmap blocks*, used in allocating the free space of the disk, are written to the disk. These blocks define and control the remainder of the disk structure, making it possible for real data files to be written to the disk. Because only a few such data blocks must be written, high-level formatting usually takes only a few seconds. Note, however, that high-level formatting can only take place after low-level formatting has been performed. The reason is this: no useful data can be written to a disk until after each block of the disk has been "initialized" to accept data.

Many hard disk vendors provide a high-level formatting program with the disk drive which takes only seconds to run.

THE WORKBENCH *FORMAT* PROGRAM

The **FORMAT** program provided with Workbench (called *INITIALIZE* on the Workbench menu) performs both low-level formatting and high-level formatting for floppy disks. By combining the two functions into a single program, Commodore has effectively made the two inseparable and has blurred any distinction between the two steps. While this may be convenient for the novice Amiga user, it leads to confusion about the formatting process later when the more sophisticated user adds a hard drive and discovers that the **FORMAT** program no longer does the full job.

FORMATTING/UNFORMATTING

The problem is that **FORMAT** *does not* perform true low-level formatting for hard disks. It can't, because low-level formatting requires an intimate knowledge of the hard disk drive and its hardware interface, which varies from drive to drive and from vendor to vendor. That is why hardware vendors usually provide a low-level formatting program with the drive when you purchase it.

FORMAT completely erase the *contents* of all blocks of a hard disk. This is unfortunate, for several reasons: 1) it can take a very long time (in excess of an hour in some cases); 2) it makes later recovery of any of the erased data impossible; and 3) it is totally unnecessary. If you use the Workbench **FORMAT** program on your hard disk, you will never be able to recover the data that was erased.

QUARTERBACK TOOLS FORMATS DISKS SAFELY

Quarterback Tools, on the other hand, performs high-level formatting for both floppy disks and hard disks that *preserves* existing data on the disk so that it can be recovered later, if necessary, and does the job in just a few seconds. It does this by making a copy of the critical data blocks (the root block and bitmap blocks) of the disk *before* erasing them. The critical data is copied to a small file which is written to an unused area of the disk. The root block and bitmap blocks are then rewritten to show that the disk is empty (except for the file containing the old root block and bitmap contents). Note that the old data files are *untouched*! Even though the disk now appears to be empty, the old files are still intact, and can be recovered by Quarterback Tools. This is a concept that we call **FORMATTING SAFELY**.

The advantage of formatting safely is that Quarterback Tools can immediately "unformat" the volume, restoring your files to their original state. It seems like magic! If you make a mistake and accidentally format a volume, you can quickly and easily reverse the mistake.

FORMATTING/UNFORMATTING

Another advantage of using Quarterback Tools to format your volumes is that Quarterback Tools looks for known bad blocks on the volume before it formats the volume. If it finds the BAD.BLOCKS file, it marks the known bad blocks as "busy" and preserves the BAD.BLOCKS file in the "empty" volume, so that AmigaDOS will not try to write a file into any of the bad blocks. The Workbench FORMAT program knows nothing about bad blocks.

WARNING - Quarterback Tools CANNOT UNFORMAT A VOLUME FORMATTED BY SOME OTHER PROGRAM. WE URGE YOU TO REPLACE THE OLD WORKBENCH FORMAT PROGRAM WITH QBFORMAT SO THAT ACCIDENTAL FORMATS CAN BE REVERSED. See page 44.

FORMAT VOLUME

Select **Format Volume** from the Main Menu or **Format Bad Volume** from the Bad Volume Menu to start the formatting process.

If the volume is valid, Quarterback Tools copies the old root block and bitmap into a file called QBT.FMT. To avoid damaging existing files, it finds two empty blocks (one for the data and one for the file header) on the disk in which to store this file. Then it erases all other file and drawer entries from the old root block and resets the bitmap to "empty" (except for QBT.FMT). Finally, it writes the new root block and bitmap back to their old positions on the volume, again to avoid damaging any old files. The result is an "empty" volume which can be instantly "unformatted" by restoring the root block and bitmap from QBT.FMT.

If the volume is not valid, Quarterback Tools does not attempt to preserve old files. Instead, it simply erases all file and drawer entries from the root block and resets the bitmap to "empty". In addition, if the volume is both invalid and a floppy disk, Quarterback Tools performs low-level formatting, just like the Workbench FORMAT program.

FORMATTING/UNFORMATTING

QUARTERBACK TOOLS CAN *UNFORMAT* YOUR DISK!

Note: Quarterback Tools usually *cannot* unformat a disk which was formatted with the Workbench **FORMAT** program. That is an excellent reason for replacing the **FORMAT** program with the specialized **QBFORMAT** program provided as a part of Quarterback Tools. See page 44.

Using Quarterback Tools instead of Workbench **FORMAT** to format your disks gives you the option of restoring your files on that disk at a later time if you should need to do so. There are two ways that Quarterback Tools can do this.

WARNING - If you write any files to a newly-formatted volume and then decide to "unformat" the volume, you may lose one or more old files as well as all the new files. Unformatting can be very dangerous and the results unpredictable if performed after other files have been written to the volume. User beware!!!

FORMATTING/UNFORMATTING

UNFORMATTING A VOLUME

Select **Unformat Volume** from the Main Menu.

Quarterback Tools first looks for the file QBT.FMT in the root drawer of the volume. If it finds the file, Quarterback Tools immediately restores the old root block and bitmap data which was saved on the disk by Quarterback Tools when the disk was formatted safely. This form of "unformatting" takes only a few seconds.

After unformatting the volume, Quarterback Tools suggests that you allow it to verify the integrity of the volume before you use it. If you agree, Quarterback Tools immediately performs the **Find (but don't repair) bad files and drawers** test. This test is especially important if you have written any files to the volume since it was last formatted safely. If this test finds problems, you should immediately run **Find and Repair bad files and drawers** to correct the problems. See page 33.

If QBT.FMT cannot be found (that is, if Quarterback Tools was not used to format the volume), Quarterback Tools can still search for "deleted" files and drawers, and can restore them as a group or individually, as you choose (See page 17). While this step takes much longer, it can be just as effective in "unformatting" the disk. This later technique works well for disks which were formatted using the QUICK option of the Workbench FORMAT program and for disks formatted using high-level formatting programs provided by the disk drive vendors.

AMIGADOS FILING SYSTEM

AMIGADOS FILING SYSTEM - A TUTORIAL

You really don't need to understand the physical or logical organization of files on a disk to use your Amiga or Quarterback Tools effectively. However, if you really want to know a little more about disk drives and what goes on inside AmigaDOS, read on. Otherwise, we suggest that you skip this section. It is boring!

HOW ARE FILES STORED ON A DISK?

Perhaps the most important fact about data storage on any hard or floppy disk is this: data is read from or written to a disk in units called *blocks*. A block usually consists of 512 bytes of data (You do know about bytes, right?) All of your files are, therefore, broken up into blocks of 512 bytes to be written to or read from the disk. And even the smallest file (one byte) takes up at least one full block on the disk, plus one block for the file header, for a total of 1024 bytes!

DISK PHYSICAL STRUCTURE - JUST A LITTLE JARGON

The *block* is the basic unit of physical data transfer between the computer and the disk. A group of blocks is organized into a *track*. Two or more tracks make up a *cylinder*. A group of cylinders is called a *partition*. A hard disk is normally divided into several partitions, each of which is treated by AmigaDOS as a separate and distinct entity called a *volume*.

DISK LOGICAL STRUCTURE - A LITTLE MORE JARGON

In addition to the file data stored on a disk, the computer also stores special blocks containing information about the files and drawers of that disk. These special blocks make up the "logical structure" of the disk. The computer uses the logical structure of the disk to control the allocation of disk space and to quickly find any drawer and file on the disk.

AMIGADOS FILING SYSTEM

When the computer writes any file to the disk, it also stores on the disk information about the file, including the name of the file, the file size in bytes, the date the file was created or last modified, and a list of locations (blocks) on the disk where the data of the file is stored. This "file header" information is stored in a block on the disk along with the file data.

As you probably already know, related Amiga files are often grouped into "drawers" (also called "directories"). The computer stores on the disk information about each drawer, including the name of the drawer, and a list of files and other drawers belonging to that drawer. This "drawer control" information is also stored in a block on the disk, one for each drawer on the disk.

AmigaDOS maintains a list of the highest level drawers in a special block known as the "root block" or "root directory". The contents of this drawer are what you see when you click on a disk icon to open its window on Workbench. Starting with the root block, AmigaDOS navigates through the drawer blocks until it finds the drawer containing the file you want to process, much the same way you navigate through the drawers by clicking on drawer icons. From the drawer control block, the computer finds the file control block, which tells it where to find the data blocks of the file.

The root block is stored in a fixed location on the disk, which makes it easy for AmigaDOS to find. It is important to be able to find the root block quickly and easily, since all other parts of the disk's logical structure (both drawer control blocks and file control blocks) are stored wherever there is room on the disk.

The root block and the first two blocks on the disk (the "reserved" blocks) are the only blocks on the disk which are stored in predefined locations. All other blocks on the disk can contain any data, and may be used for drawer control, file control, or actual file data.

QBFORMAT

The Quarterback Tools package includes QBFORMAT, a program designed to replace the Workbench FORMAT program. QBFORMAT performs the same formatting functions as FORMAT, but does them "safely", so that your files can be restored, if necessary, using the "Unformat Volume" function of Quarterback Tools.

INSTALLING QBFORMAT

To install QBFORMAT, place the Quarterback Tools master disk in a floppy disk drive. Open the QBT disk icon and double-click on "INSTALL QBFORMAT". This starts a script which renames your old FORMAT program (so that it won't be overwritten) and copies QBFORMAT to your SYSTEM drawer as FORMAT.

"SNAPSHOTTING" YOUR VOLUMES

The QBFORMAT program includes a feature to take a "snapshot" of the root block and bitmap of a volume at any time, saving the contents of these critical blocks in a file on the volume called QBT.FMT. This is the same procedure followed by Quarterback Tools and QBFORMAT when formatting a volume safely. The purpose of this feature is to simplify repair of the volume if something goes wrong and the volume becomes invalid.

This feature is invoked by starting QBFORMAT (which should have been renamed "FORMAT" by the installation script) with a -S option:

FORMAT volume-name -S

This immediately snapshots the contents of the volume named. If your system includes several different partitions, you must snapshot each with a separate command.

QBFORMAT

WARNING - MAKE ABSOLUTELY CERTAIN THAT YOU HAVE PROPERLY INSTALLED QBFORMAT AS A REPLACEMENT FOR THE WORKBENCH FORMAT PROGRAM BEFORE USING THIS COMMAND!

You may wish to add **FORMAT -S** commands for each of your critical volumes to your startup-sequence or to schedule snapshots on a time-of-day basis using a timer program, such as the public domain program **CRON**.

SAVE/LOAD OPTIONS

SAVE/LOAD OPTIONS

The Project menu includes selections to save and load configuration options. These configuration options are other menu selections, such as reorganization mode, memory usage, screen mode, report mode, and report path. Quarterback Tools automatically loads the saved configuration, if any, when you start the program.

If you select Save Options from the Project Menu, Quarterback Tools saves the state of these items in a file in the S: directory called QBT.OPT.

If you select Load Options from the Project Menu, Quarterback Tools restores the previously saved state of these items from the file S:QBT.OPT.

AREXX SUPPORT

AREXX SUPPORT

Quarterback Tools can receive commands via an Arexx port. This lets you pass commands from another program to Quarterback Tools. You can use the Arexx interface to perform time-consuming steps such as volume validity checks or volume reorganization on a scheduled basis during off hours.

To use this feature, you must have Arexx running on your Amiga. Arexx is a product of another company, and is not included with Quarterback Tools. It is included as part of Workbench 2.0.

To use the Arexx interface, start Quarterback Tools from CLI or from a script. An Arexx program can communicate with Quarterback Tools via the address command:

```
ADDRESS 'QBT_AREXX'
```

Quarterback Tools responds to the following commands and produces the following results:

EXIT	Terminates Quarterback Tools.
VOLUME name	Selects volume to process.
DRIVE name	Selects drive to process.
LOAD	Loads previously saved options.
SAVE	Saves options.
ABOUT	Returns Quarterback Tools version.
FRAGMENTATION	Performs fragmentation check on selected volume and returns count of fragmented files.
REORGANIZE	Reorganizes selected volume.

AREXX SUPPORT

RESTORE name	Attempts to restore file.
MARK	Finds and marks bad blocks, and returns count of bad blocks found.
FIND	Finds volume problems. Returns count and severity.
REPAIR	Attempts to repair volume problems.
FORMAT	Formats volume safely.
UNFORMAT	Attempts to undormat volume.
SCREEN mode	Sets screen mode to INTERACTIVE, INFORMATIVE, or QUIET.
MEMORY usage	Sets memory usage to LOW, MEDIUM, or HIGH.
OPTIMIZE mode	Sets optimization mode to WORKBENCH or CLI.
AMIGADOS mode	Sets AmigaDOS mode to ENABLED or DISABLED.

GLOSSARY

GLOSSARY

Active file	A file which has not been deleted.
Bad blocks	Disk blocks which are known to have physical errors, and which must be avoided to prevent possible loss of file data.
Bitmap	A volume file control structure containing one bit for each block on the volume, indicating whether or not the block is available (empty) or busy (contains data belonging to a particular file).
Block	A basic unit of data storage on a disk, consisting of a group of 512 bytes of data which are read and written together. Also called sector.
Checksum	AmigaDOS detects some logical disk errors by performing a mathematical "checksum" calculation on all 512 bytes of selected blocks. If the test fails, the block is considered to be invalid, and the data useless. Quarterback Tools can usually repair checksum errors, restoring the invalid block to service.
Cylinder	Two or more tracks, each on a different surface of a disk.
Defragmenting	The process of collecting into one place on the disk the scattered pieces of a fragmented file.

GLOSSARY

Device driver	Software which controls the disk drive (a "device"), performing disk reads and writes in response to requests from AmigaDOS, Quarterback Tools or other programs.
Fast File System	A new and greatly improved file storage scheme for the Amiga first introduced as an option under Workbench V1.3.
File header	A control block containing information about a specific file, such as the name, size, creation date, and the physical location and order of all data blocks of the file.
Format	The process of preparing a volume to store files by writing an "empty" file structure to it. Also called <i>Initialize</i> .
Fragmented file	A file which has been broken into two or more pieces (fragments) which are stored in different, non-contiguous areas of the volume.
Initialize	The process of preparing a volume to store files by writing an "empty" file structure to it. Also called <i>Format</i> .
Invalid Volume	A volume which has failed the basic integrity tests applied by AmigaDOS. If the volume fails these tests, AmigaDOS may refuse to read files from it or write files to it. Quarterback Tools can often repair the problem, so that AmigaDOS can validate the volume, making the files available again.

GLOSSARY

Key	A unique identification number assigned to each block of a volume. The key corresponds to a physical track and sector address on the disk.
Logical Error	A disk read error caused by corrupted data having been written to the volume during some previous write operation. Usually caused by software. Logical errors can be cured by replacing the corrupted data with good data, if possible. Logical errors are detected by AmigaDOS.
MaxTransfer	A parameter defining the maximum number of bytes which can be transferred to or from a disk drive in a single command. Hardware dependent.
Old File System	The original file storage scheme for the Amiga.
Partition	An area of a hard disk having a unique volume name and containing its own logical file structure. A hard disk can be divided into many partitions.
Physical Error	A disk read (or write) error caused by physical damage to the magnetic recording medium , failure of the disk drive mechanism, or failure of the disk controller. These are hardware problems, and usually cannot be corrected by software. Physical errors are detected by the disk driver software.

GLOSSARY

Reorganization	The process of defragmenting files and repositioning files and drawers to optimum physical locations to maximize disk performance.
Reserved blocks	Two or more blocks at the beginning of a volume which are excluded from the active file space of the volume.
Root block	A drawer stored in a predefined location on a disk containing the name of the volume and information about all other drawers and files found on the volume.
Sector	A basic unit of data storage on a disk, consisting of a group of 512 bytes of data which are read and written together. Also called <i>block</i> .
Snapshotting	Preserving the current contents of the root block and bitmap of a volume so that they can be restored if the volume becomes corrupted.
Surface	A magnetic medium onto which concentric tracks of data are written. Also known as <i>side</i> . A double-sided disk has two surfaces.
Track	A group of blocks read and written as a single line of magnetic flux changes on a single surface of a disk.

GLOSSARY

Valid Volume	A volume which has passed the basic integrity tests applied by AmigaDOS when the volume is loaded into a disk drive or at startup in the case of hard disk volumes. If the volume passes these tests, AmigaDOS displays its icon on the Workbench screen and makes it available for reading and writing files.
Validation	The process of verifying the integrity of a volume by performing certain simple tests on the root block and bitmap which help AmigaDOS detect and avoid a corrupted volume. These tests are conducted when the volume is first made available to the system.
Volume	A user-defined name associated with a particular diskette or hard disk partition. Files on that disk can be referenced using the volume name instead of the disk drive name.

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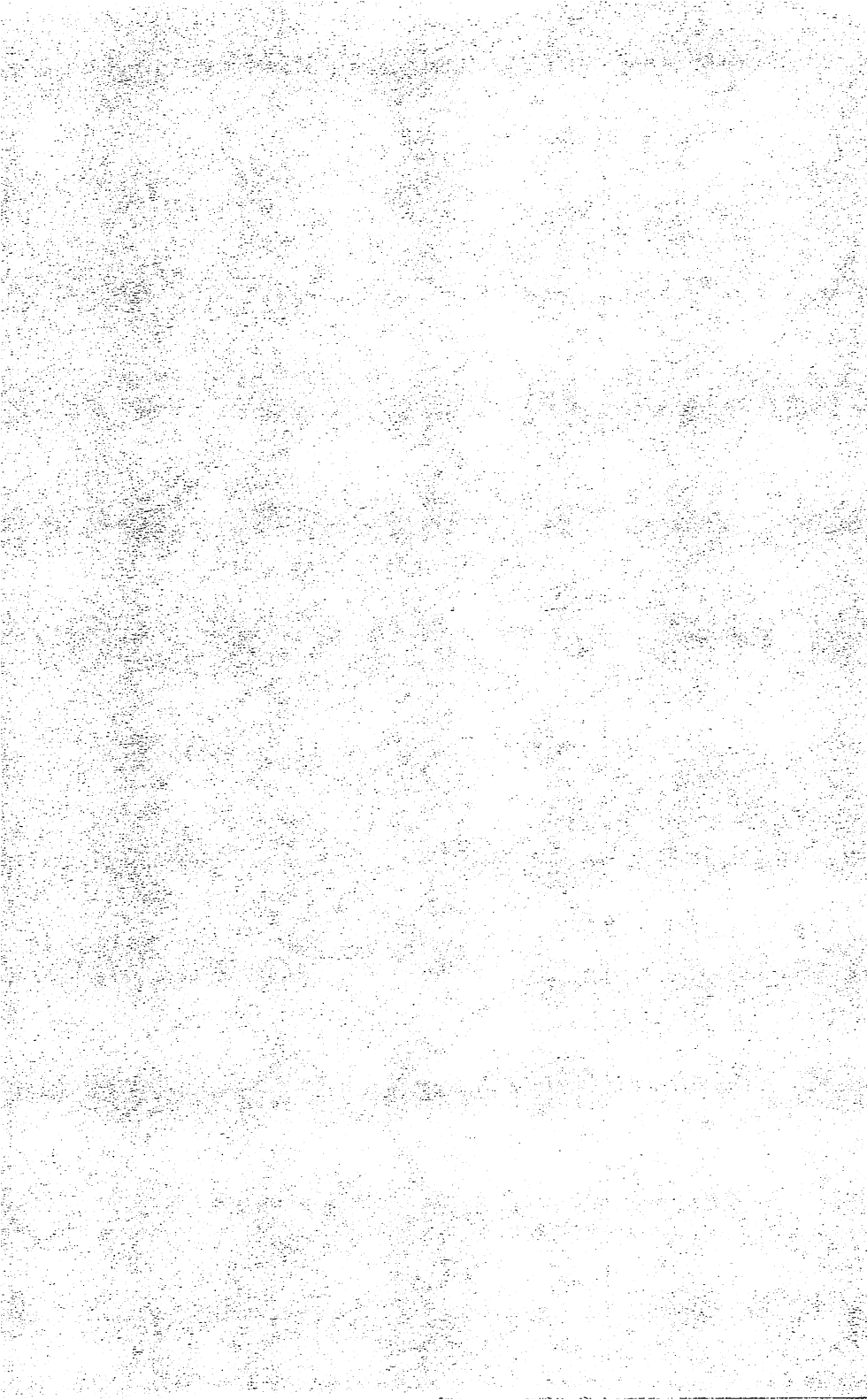
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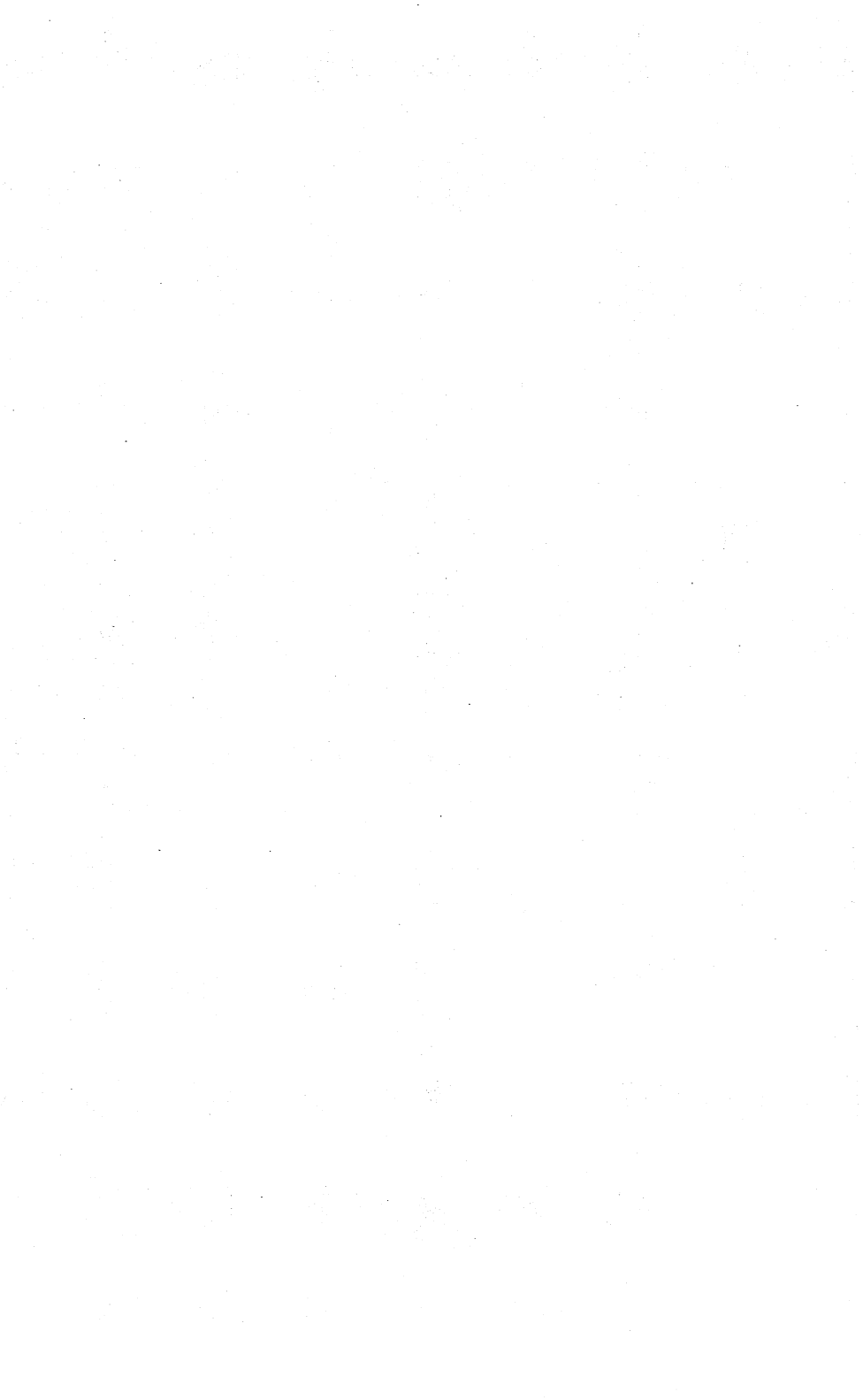
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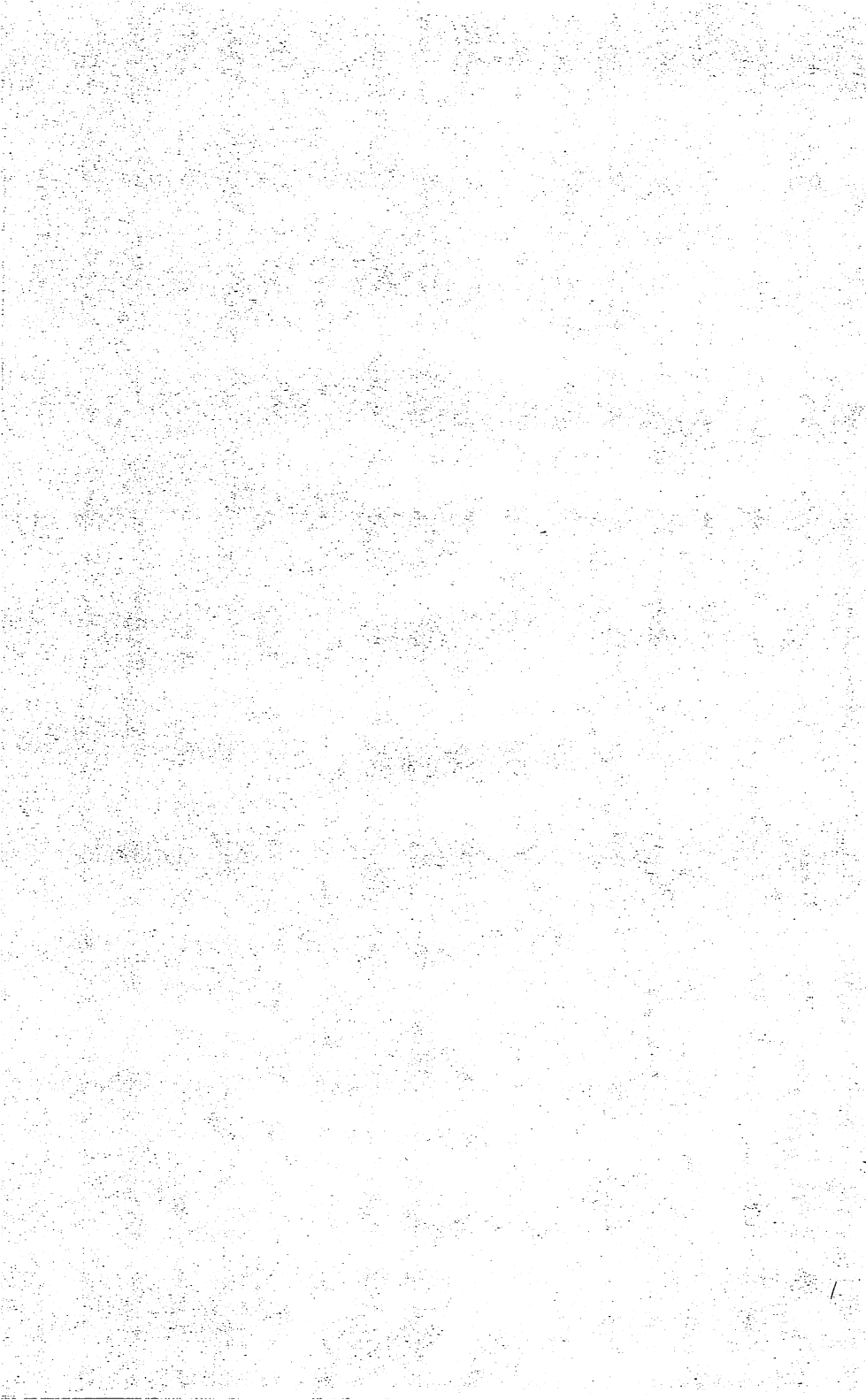
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USER NOTES









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